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Trust vs. Confidence

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Abstract

This short theoretical paper works to distinguish the concept of trust from the concept of confidence. Although these terms are often used interchangeably and have some commonalities, this paper argues that they are different in several ways. A confidence judgement typically has a very specific referent, and is influenced by base rates and prior probabilities. A trust judgement has a broader scope and referent and is characterized by a specific lack of information, and by the need to take a "leap of faith" from what is known to what is unknown. Moreover, unlike confidence judgements (which can occur in many situation), trust is only an issue in the presence of risk, uncertainty, vulnerability and the need for interdependency with another person (Mayer et al., 1995). Without these situational antecedents, trust is not likely to come into play. In short, it is important to make a distinction between the concepts of trust and confidence.

Résumé

Cette brève étude théorique vise à différencier deux concepts : la foi (*trust*) et la confiance (*confidence*). Bien que ces termes soient souvent employés de manière interchangeable et présentent des similitudes, ils diffèrent à plusieurs égards, selon cette étude. De manière générale, un jugement basé sur la confiance (*confidence judgement*) repose sur des fondements très précis. Il est dicté par des données de référence et des probabilités fondées sur des données historiques. Quant au jugement basé sur la foi (*trust judgement*), il a une base et une portée plus générales. Il repose sur l'absence de données précises et sur la nécessité de « faire le saut de la foi », le passage du connu à l'inconnu. Cependant, contrairement à un jugement fondé sur la confiance (qui peut être porté dans bien des situations), la foi n'entre en jeu qu'en présence du risque, de l'incertitude, de la vulnérabilité et de la nécessité d'établir un rapport d'interdépendance avec une autre personne (Mayer et coll., 1995). Sans ces éléments circonstanciels, il est peu probable que la notion de foi intervienne. Bref, il est important d'établir une distinction entre la foi et la confiance.

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Executive Summary

This short theoretical paper works to distinguish the concept of trust from the concept of confidence. Certainly, there are many similarities between trust and confidence. Both trust and confidence involve positive expectations about future events, and both are the culmination of some sort of decision making process. The term "confidence" is relevant to many different contexts, including judgements about other people, about ourselves, and about objects and events. This is also true of trust, and it does make sense to think about trust with respect to other people, as well as in attitudes toward automation.

However, despite these similarities and although these terms are often used interchangeably, this paper argues that they are different in several ways. A confidence judgement typically has a very specific referent, and is influenced by base rates and prior probabilities. A trust judgement has a broader scope and referent. In the case of a prototypic trust judgment, for example, one considers not only a specific behaviour, but an entire pattern of behaviour, and makes a judgement about why the previous behaviour occurred as it did. In this sense, trust also involves attributional abstraction and is characterized by the need to take a "leap of faith" from what is known to what is unknown. Whereas confidence involves subjective probability judgements, trust involves the ascription of intentions at a dispositional level, and both cognitive and affective factors can be implicated in trust judgements. Moreover, unlike confidence judgements (which can occur in many situation), trust is only an issue in the presence of risk, uncertainty, vulnerability and the need for interdependency with another person (Mayer et al., 1995).

In summary, a confidence judgment is a discrete reason-based judgement related to the probability of a specific event occurring that often occurs in situations without risks. A trust judgement, on the other hand, uses a variety of information beyond the merely cognitive, occurs only when something is at stake, and can require extrapolation beyond the information that is immediately available for use in a broader set of inferences. These important conceptual differences demand more careful use of the terms "trust" and "confidence".

Sommaire

Cette brève étude théorique vise à établir une distinction entre la foi (*trust*) et la confiance (*confidence*). Les deux notions présentent bien sûr de nombreuses similitudes. Elles sont toutes deux porteuses d'une vision optimiste de l'avenir, et sont l'une et l'autre l'aboutissement d'un certain processus décisionnel. La notion de « confiance » s'applique à de nombreux contextes différents, notamment aux jugements portés sur d'autres gens, sur soi-même, ainsi que sur les objets et les événements. La remarque vaut également pour la notion de foi. En effet, la foi peut intervenir aussi bien dans les rapports avec d'autres personnes que dans les attitudes envers l'automatisation. Toutefois, malgré leurs ressemblances et bien que ces termes soient souvent utilisés de manière interchangeable, ils diffèrent à plusieurs égards, selon cette étude. Grosso modo, un jugement fondé sur la confiance repose sur une base très précise. Il est dicté par des données de référence et des probabilités fondées sur des données historiques. Quant au jugement fondé sur la foi, il a une base et une portée plus générales. Ainsi, lorsqu'on porte un jugement type fondé sur la foi, on tient compte non seulement d'un comportement précis, mais d'un modèle de comportement, et on s'interroge sur les raisons qui expliquent un comportement antérieur. En ce sens, la foi implique un jugement d'attribution et se définit par la nécessité de « faire le saut de la foi », le passage du connu à l'inconnu. Si la confiance suppose des jugements fondés sur la probabilité subjective, la foi implique l'attribution d'une intention par inférence de disposition, et elle peut faire intervenir aussi bien des facteurs cognitifs que des facteurs affectifs. De plus, à la différence du jugement basé sur la confiance (qui peut être porté dans bien des situations), la foi n'entre en jeu qu'en présence du risque, de l'incertitude, de la vulnérabilité et de la nécessité d'établir un rapport d'interdépendance avec une autre personne (Mayer et coll., 1995).

Bref, un jugement basé sur la confiance est un jugement raisonné sur la probabilité de survenue d'un événement précis; il est souvent porté dans un contexte où le risque est absent. Un jugement fondé sur la foi, par contre, fait appel à des éléments d'information qui ne relèvent pas strictement du domaine cognitif; il n'intervient que lorsqu'il y a un enjeu. Dans certains cas, l'information immédiatement accessible doit faire l'objet d'une extrapolation avant de pouvoir être utilisée dans une série d'inférences plus générales. Étant donné ces différences conceptuelles importantes, il convient de faire preuve de plus de circonspection dans l'emploi des termes « foi » et « confiance ».

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1. Introduction

Our goal in this short paper is to explore the relationship between trust and confidence as depicted in the existing literature. The existing social science literature often fails to make a clear distinction between the concepts of "trust" and "confidence". Even in the trust literature, these terms are often used interchangeably. Work by Golembiewski and McConkie (1975; cited in Hosmer, 1995), for example, argues that trust "implies reliance on, or confidence in, some event, process or person", and that trust "is strongly linked to confidence in, and overall optimism about, desirable events taking place." These theorists, then, see the construct of trust as subsuming confidence in some way. Other theorists have used the construct of confidence interchangeably with trust. This tendency to use the term confidence instead of trust is prevalent in the military context (e.g. Thomas and Barios-Choplin, 1996). Research exploring the factors that underlie soldier responsibility and active engagement, for example, used a single measure purported to relate both trust and confidence (Britt, 1999). Within the military system, the term "confidence" is sometimes preferred to "trust" because the former term does not have "touchy feely" implications which are deemed by some to be undesirable in the military domain (Adams and Webb, 2003). In some of the trust literature, confidence is argued to be subsumed by trust; in other literature, they are considered equivalent. Other theorists, however, have argued that trust and confidence are two distinct constructs (e.g. Luhmann, 1988), and should be treated as such.

This paper explores the constructs of trust and confidence with respect to another body of work in process at DRDC Toronto, namely that of Baranski on confidence calibration. Is the Baranski confidence construct the same as that mentioned frequently in the trust literature? How does work related to confidence apply to issues of trust, and can these two bodies of work inform each other? The goal of this paper is to consider the relationship between our concept of trust, and the notion of confidence as represented by Baranski's work and to explore and articulate the key similarities and differences between these two constructs.

We will therefore explore both trust and confidence as they are currently represented within these two diverse bodies of work. In addition, we also consider how the two concepts should be regarded and we will present heuristics that could be used in our future trust work to distinguish between them.

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2. Definitions of Confidence and Trust

At a colloquial level, confidence is often used interchangeably with the concept of trust, and we often talk of having confidence in other people, or in their abilities. More formally, the term "confidence" has a number of components. Webster's Revised Unabridged Dictionary (1913) defines confidence as the following:

1. The act of confiding, trusting, or putting faith in; trust; reliance; belief;
2. That in which faith is put or reliance had.

This definition implicates a confidence judgement as involving trust. Other concepts relevant to trust, particularly reliance and faith, are also used to describe confidence. At both a formal and informal level, then, trust and confidence are closely conceptually linked.

In the behavioural decision making literature, a good deal of attention has been paid to the issue of confidence. From a generic behavioural decision making perspective, confidence has been described as the "degree of belief in a given hypothesis" (Griffin and Tversky, 2002). This definition argues that confidence has two main components: 1) the given hypothesis, and 2) the level of belief or certainty that one has in that hypothesis or decision. A body of work by Baranski and colleagues specifically employs the concept of confidence and this use of the term in an experimental context highlights a distinction between trust and confidence. Baranski and Petrusic (2003) use the term confidence to refer to the concept employed when a person decides whether or not their decision was correct or good. They describe how the amount of evidence necessary to make a decision will change based on the contextual factors in play when the decision must be made (e.g., accuracy-stress or speed-stress). Baranski and Petrusic (2003) point out that this view allows us to infer "confidence", which is then implicitly defined as the difference in accumulated evidence totals on which a decision is made. The greater the difference in the amount of evidence supporting competing decisions, the more confident one feels about one's decision. Baranski and Petrusic (2003) also posit that in conditions of high contextual difficulty, one strives to be more confident or certain about the information one has collected, or else, one is more cautious. In their research, confidence is operationally defined on a scale from 0-100 as the degree of certainty that one has (0) or has not (100) made an error. If one is neither completely certain nor uncertain, this indicates a guess (50). Again, the view is that one makes a decision and then establishes one's certainty around the decision, i.e., the confidence judgement. This view of confidence is consistent with the notion that it involves one's belief in a specific hypothesis.

In contrast, it is also important to consider how trust is defined. Although there are many different definitions of trust, our definition (Adams and Webb, 2003) is as follows:

> Trust is a psychological state involving positive confident expectations about the competence, benevolence, integrity and predictability of another person and willingness to act on the basis of these expectations. Issues of trust arise in contexts that involve risk, vulnerability, uncertainty and interdependence. Trust expectations are created primarily by the interaction of the perceived qualities of the trustee and contextual factors in play when trust decisions are made.

This definition clearly argues that trust relates to expectations around several key properties of the trustee, and is affected by both interpersonal and contextual factors. The next section directly contrasts trust and confidence.

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3. Parallels and Differences

Based on these definitions, trust and confidence have several conceptual similarities. Both are the culmination of some sort of decision making process. The term "confidence" is relevant to many different contexts, including judgements about other people, about ourselves, and about objects and events. This is also true of trust. We have argued, for example, that it does indeed make sense to think about trust with respect to other people, as well as in attitudes toward automation. Moreover, both trust and confidence involve positive expectations about future events.

Other trust theorists, however, have suggested that trust and confidence are two different, albeit related, concepts. A prominent trust in automation theorist, for example, has argued that trust and confidence are two different constructs. In talking about the accuracy of predicted outcomes, Muir (1994) argues:

> *"...a person who makes a prediction may associate a particular level of certainty, or confidence, with the prediction. Thus, confidence is a qualifier which is associated with a particular prediction; it is not synonymous with trust."*

This definition suggests a need to distinguish between trust and confidence, but fails to elaborate on exactly how trust and confidence are actually different. We argue that trust has several features that distinguish it from confidence.

First, trust and confidence are different because of the knowledge underlying them. As Shaw (1997) argues, for example,

> *"Confidence arises as a result of specific knowledge; it is built on reason and fact. In contrast, trust is based, in part, on faith."*

This assertion has two different components that are important to consider in more detail.

First, the quotation suggests that confidence is related to specific knowledge, and that trust is implicitly related to something other than (or more than) specific knowledge. Confidence relates to specific knowledge about a finite referent. In this sense, a confidence judgement has a very specific referent, and is influenced by base rates and prior probabilities. This is consistent with the depiction of confidence in the Baranski work. Confidence judgements can be based on what has been observed in the past, with little extrapolation from these observations. One's decision to trust (or not) is influenced by more than prior probabilities. Although trust judgements can also involve specific knowledge about behaviour (e.g. the probability of "X" performing a particular behaviour that I need "X" to perform), they are also typically associated with broader attributions about the referent (e.g. what kind of person "X" is). In making a trust judgement, one considers not only prior behaviour, but also makes attributions about why someone behaved as they did, and what their true intentions are (perhaps even independently of behaviour). As such, the referent and scope of a trust judgement is very different from that of a confidence judgement.

Shaw's distinction also argues that confidence stems from reason and fact, and trust from faith. Certainly, confidence judgements do seem to typically stem from reason and fact. The Baranski work, for example, can be characterized as adopting a rationalistic decision making paradigm that focuses primarily on cognitive aspects. These include the comparison of response alternatives from what has been called a *consequentialist perspective*. Nonetheless, a confidence judgement is a discrete judgement made in relation to a specific target. The argument that trust is based on faith, rather than reason and fact, is evident at different points in trust literature, with trust depicted as

being affective, and confidence as being cognitive (Madsen and Gregor, 2000). However, we disagree with the characterization of trust as based on faith, and confidence as based on reason and fact. Trust is not always based in faith, but can be based on reason and fact too. In fact, we argue that trust development begins as soon as people observe the behaviour of the target with little interpretation or need for attributional abstraction. They simply observe the behaviour and the "facts" presented. When asked to make a judgement about the probability of a similar behaviour in the future, people can simply rely on the patterns of behaviour already evidenced from the facts. Thus trust can be based on both reason and fact. However, this characteristic alone does not distinguish it from confidence.

The level of attributional abstraction required in making trust judgements, however, does distinguish them from confidence judgements (as described in the behavioural decision making research). When participant are asked to say how confident they are that two lines are parallel (e.g., Baranski & Petrusic, 2003), for example, there is little "poetic license" in such a judgement. The ability to go beyond the evidence is possible only if there are more complex forms of behaviour that require causal interpretation (attribution) and extrapolation beyond the evidence (attributional abstraction). Trust is defined, in part, by the ascription of intentionality to the trusted agent. As trust progresses, a higher level of attributional abstraction – that is, of going beyond the information given -- is required: one takes a "leap of faith" (Rempel, Holmes and Zanna, 1985). As such, trust ranges from being based on reason and fact to being based on expectations beyond what reason and fact would dictate (e.g. on faith). In our view, then, judgements about the trustworthiness of another person represent one small part of a larger process of impression formation. We not only judge their trustworthiness, but their attitudes and values, their predicted behaviour, and their motivation with respect to us. The knowledge that we bring to bear when making a trust judgement is not merely cognitive (e.g. reliance on base rates etc), but also emotional and motivational. As such, from another perspective, the referent of a trust judgement is inherently more complex than is typically the case for the referent of a confidence judgement.

The most explicit and commonly cited conceptual distinction between trust and confidence in the trust literature comes from Luhmann (1988). He argues that confidence and trust are similar in that they both involve positive expectations that may or may not lead to disappointment. Trust differs from confidence, however, in that it involves a prior engagement on the part of a person to both recognize and accept that risk exists. Luhmann's argument, at least implicitly, is that trust requires the situational antecedent of risk, and confidence does not. Judgements of trust arise in situations in which people both recognize and accept that they are at risk and that they are vulnerable to negative outcomes. Confidence does not require this recognition of risk. As trust is frequently conceptualized as being an issue in the presence of risk, uncertainty, vulnerability and interdependency, the presence or absence of these situational antecedents can perhaps be used to distinguish between trust and confidence. Although confidence judgements can occur in varying contexts (i.e. involving risk), they need not. Thus it makes sense to talk of one's confidence in an event occurring, even if risk and uncertainty are not a highly prominent aspect of the context. And, confidence judgements can be entirely devoid of personal self-interest. On the other hand, trust is only an issue in the presence of risk, uncertainty, vulnerability and the need for interdependency with another person (Mayer et al., 1995). Without these situational antecedents, trust is not likely to come into play.

We have argued (Adams, Bryant and Webb, 2001) that trust is an iterative process in which people accumulate information and update their judgements based on new information. The notion that confidence involves a weighing of evidence implies that the processes of building trust and building confidence are similar. Moreover, one's degree of trust in an individual likely depends on

levels of competing information. That is, one might have greater trust (e.g., 90%) in someone who has a higher ratio of behaving in trustworthy ways to untrustworthy ways (e.g, 4:1), than someone whose ratio is smaller (e.g, 70% trustworthiness based on a 3:1 ratio). In this regard, trust is similar to Baranski's confidence concept. Furthermore, if one is forced to make an untimely decision on a target's trustworthiness, one may have to make a guess, as in Baranski's operational definition of confidence. Finally, the more important the trust decision, as on a military mission, the more accurate one might want the information to be and the more cautious one is likely to be about a decision. Thus, because the processes may be argued to be similar, trust can be said to be like confidence.

Despite these similarities, however, there are also qualitative differences between Baranski's use of the tern "confidence" and the trust construct. As we argued above, confidence is based on reason and fact with little attributional abstraction, whereas trust can involve reason and fact. However, coming to trust another person requires a deeper level of interpretation about their actions and intentions, in essence, more attributional activity. Baranski's notion of confidence seems to be based more on amounts of accumulated evidence than on the interpretation of this evidence. Thus, we would suggest that this concept of confidence does not consider the relative magnitude of pieces of information, further highlighting the qualitative difference between confidence and trust. As our distrust review argues (Adams and Sartori, 2005), one serious violation of our trust can change our trust in another person to distrust. In contrast, Baranski's notion of confidence considers only the number of pieces of information, not their strength or importance. NOT SURE THAT I AGREE WITH THIS.

This account of the differences between trust and confidence finds support in recent work by Ullman-Margalit (2004). Specifically, she argues that

> *"Another notion from which trust has to be differentiated is confidence or reliance. The latter notions do not essentially involve the imputing of intentions; they lend themselves more readily to the subjective probability approach. I may rely on or have confidence in, something (a bridge, for example), not only in someone. Trust, in contrast, relates only to people." (Ullmann-Margalit, 2004).*

From our perspective, trust often involves the ascription of intentions, whereas confidence is only a subjective probability judgement. We disagree, however, that the referents of trust and confidence are wholly distinct. Clearly, it is meaningful to think about "trust in automation" (Adams, Bruyn and Houde, 2003), when this is predicated on something more than simple probabilities and base rates. Similarly, it is also possible to have confidence in one's teammate on a specific issue (e.g. whether this person is likely to arrive on time). The key issue is the kind of judgement that is being made.

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4. Heuristics for Distinguishing Trust and Confidence

This analysis suggests that it is critical to separate the concept of trust from the concept of confidence. Within the existing literature, however, we have noted that sometimes the term "confidence" is used when "trust" is the appropriate construct and vice versa. As the existing and developing literature is unlikely to change in order to make this distinction better, our goal in this section is to provide the tools to help distinguish between the concepts of "trust" and "confidence" at a conceptual level, independently of how these two concepts are actually labelled.

Perhaps one of the reasons why trust and confidence have been so conceptually entangled is that they are sometimes highly correlated. As such, asking a person how confident they are that a specific person is likely to arrive at a scheduled meeting on time can be argued to be a confidence judgement. One's judgement in this case is likely to be based on observable, rational fact, and one is likely to rely on past behaviour (e.g. "how often does this person usually arrive for meetings on time?") in order to judge the likelihood of this occurring. In this case, there is specific referent, an absence of personal risk or uncertainty, and the decision can be based solely on the base rate frequency of this occurrence.

On the other hand, a person's confidence that their friend will arrive on time to a mutually planned meeting is a trust judgement. While one might judge the predictability of the friend's behaviour on the basis of a very constrained set of previous behaviours, a broader range of information is much more likely to come into play. One could make attributions about whether is person is the kind of person who is perpetually late. This level of interpretation speaks to a more dispositional rather than situational attribution about this person's behaviour. Moreover, while waiting for a friend, one is personally invested in the outcome of this decision (e.g. there is risk) in a way that is not the case for confidence judgments. As a product of the relationship with the friend, one's own outcomes (e.g. having a good time together) are dependent on the friend. The notion of personal investment, then, also makes this a trust judgement rather than a confidence judgement.

A confidence judgment is a discrete reason-based judgement related to the probability of a specific event occurring that lies outside the domain of risk to the person making the judgement. A trust judgement, on the other hand, uses a variety of information beyond the merely cognitive, occurs only when something is at stake, and can require extrapolation beyond the information that is immediately available for use in a broader set of inferences.

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5. Summary

To sum up then, we argue that trust judgements can be distinguished from confidence judgements in several ways, as indicated by the Table 1.

Table 1: Comparing trust and confidence

Dimension	Trust	Confidence
Nature of knowledge and of the referent	Discrete or holistic judgement – likely to be integrated into broader picture	Specific referent and discrete judgement
Level of attributional abstraction possible	From low to high	Low
Information used to make the decision	Broad range of information, including past behaviour, current behaviour, other life experiences - Cognitions, emotions and motivations	Base rates and prior probabilities most relevant - Cognition
Contextual factors	Decisions that involve risk, vulnerability, uncertainty and interdependence necessary	Decision only needed
Typical type of decision task	Social impression formation	Perceptual Visual discrimination task Visual gap detection

As this analysis suggests, trust can be distinguished from confidence by the fact that it typically involves a holistic rather than a discrete judgement, requires a higher level of attributional abstraction, relies on a broad range of information, and is only meaningful in situations with risk. At a broader level, then, a trust decision typically involves the formation of an impression about another person rather than merely making an estimate with respect to a discrete and specific task.

In short, the confusion of the terms "trust" and "confidence" is potentially problematic, because it has the potential to hamper the development of the trust literature, as well as to muddle the behavioural decision making literature. At an informal level, the concepts of "trust" and "confidence" both refer to the culmination of some decision making process that renders a positive judgement about an event. More formally, however, from our perspective, trust and confidence can be delineated by several key conceptual differences, including the scope of knowledge about the referent, the contextual factors in play, and the kind of judgement that one is making.

At a very simplistic level, one's view of the trustworthiness of another person is likely to be influenced by many different kinds of discrete confidence judgements about that person's specific behaviours in a variety of contexts. But even the algebraic combination of many different confidence judgements is not a trust judgement. The integration and the extension of such information is what characterises a trust judgement.

In short, it is important to make a distinction between formal and informal usage of the concepts of trust and confidence. These key conceptual differences between trust and confidence, moreover, argue that we should be cautious in attempting to use existing behavioural decision making research on confidence in order to understand trust judgements or vice versa. Despite this, however, it seems important to continue to monitor the behavioural decision making research as it develops.

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(U) This short theoretical paper works to distinguish the concept of trust from the concept of confidence. Although these terms are often used interchangeably and have some commonalities, this paper argues that they are different in several ways. A confidence judgement typically has a very specific referent, and is influenced by base rates and prior probabilities. A trust judgement has a broader scope and referent and is characterized by a specific lack of information, and by the need to take a "leap of faith" from what is known to what is unknown. Moreover, unlike confidence judgements (which can occur in many situation), trust is only an issue in the presence of risk, uncertainty, vulnerability and the need for interdependency with another person (Mayer et al., 1995). Without these situational antecedents, trust is not likely to come into play. In short, it is important to make a distinction between the concepts of trust and confidence.

(U) Cette brève étude théorique vise à différencier deux concepts : la foi (trust) et la confiance (confidence). Bien que ces termes soient souvent employés de manière interchangeable et présentent des similitudes, ils diffèrent à plusieurs égards, selon cette étude. De manière générale, un jugement basé sur la confiance (confidence judgement) repose sur des fondements très précis. Il est dicté par des données de référence et des probabilités fondées sur des données historiques. Quant au jugement basé sur la foi (trust judgement), il a une base et une portée plus générales. Il repose sur l'absence de données précises et sur la nécessité de « faire le saut de la foi », le passage du connu à l'inconnu. Cependant, contrairement à un jugement fondé sur la confiance (qui peut être porté dans bien des situations), la foi n'entre en jeu qu'en présence du risque, de l'incertitude, de la vulnérabilité et de la nécessité d'établir un rapport d'interdépendance avec une autre personne (Mayer et coll., 1995). Sans ces éléments circonstanciels, il est peu probable que la notion de foi intervienne. Bref, il est important d'établir une distinction entre la foi et la confiance.

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(U) confidence vs. trust distinction; probability vs. disposition